

SPECIFICATION:

Please amend paragraphs 40, 47, 51, 56, 59, 60, 64 and 75 as follows:

[0040] Fig. 5A is a plan view showing a structure of the rotor core, and Fig. 5B is a plan view showing a structure of the permanent magnet. As shown in Fig. 5A, the salient poles 3a formed at the rotor core 3 have circular arcs 3b having radii R3 at circumferential center portion and circular arcs 3f having radii R4 at circumferential end portions. That is, the facing surfaces of the salient poles 3a which face the permanent magnets 1a and 1b are formed in the shapes of circular arcs among which the radii of the circular arcs 3b and 3f are different from each other, and a distance G exists between the center positions of the circular arcs having the radii R3 and R4. Specifically, the distance from the radial outline of the circumferential center portion of the salient poles 3a to the rotation center of the rotor core 3 is not more than 99% of that from the radial outline of the circumferential end portion of the salient pole to the rotation center of the rotor core 3. The angle K between the line connecting one of circumferential outlines 3h of the salient pole 3a and the rotation center of the rotor core 3 and the line connecting the other circumferential outline 3h of the same salient pole 3a and the rotation center of the rotor core 3 is not less than 100 degrees.

[0047] In Fig. 1, reference numeral 32 denotes a cover, and the cover 32 is mounted to the spring housing 39 by ~~a bolt 33 screwed to the rotor shaft 4~~ bolts. The cover 32 prevents from the removal of stoppers 30a and 30b.

[0051] Fig. 7 shows the states in which the rotor core 3 rotates by 20 degrees-~~within a rotation range from "0 degree", at which no exciting current is supplied, to "180-degrees" by supplying exciting current~~ within a rotation range from "0 degree" to "180 degrees". As described above, the electro-magnetic torque of the rotor core 3 is proportional to the magnitude of the exciting current within the proportional range, which is not less than 90 degrees. Therefore, if the rotor coil is excited by a properly chosen current, the rotor core 3 can be rotated to and held at a freely selected angular position within the proportional range not less than 90 degrees by the opposite torque generated by the opposite torque generating portion B, and the rotor core 3 can be returned to an

initial angular position by the opposite torque if the supply of exciting current is stopped.

[0056] As shown in Fig. 11, in the Second Embodiment, two stoppers 30a and 30b are fixed between the holder 6 and the spring housing 39, instead of the spring securing plate 38 of the First Embodiment thereat, and two spring driving rings 35 are fixed on the rotor shaft 4 by the keys 34 inside the internal sides of two pairs of the stoppers 30a and 30b, respectively. Two spring rings 31 are rotatably supported by the rotor shaft 4 next to the spring driving rings 35, so that the rotation locus of the protrusions 31a thereof overlaps with ~~that of the stoppers 30a and 30b~~ that of the protrusions 35a of the spring driving rings 35. The spring rings 31 and spring driving rings 35 are disposed in the same manner as the First Embodiment. Between the two spring rings 31 there is a space where a coil spring 36 is mounted, and two ends of the coil spring 36 are respectively inserted into the holes 31b of the spring rings 31.

[0059] As shown in Fig. 13, the rotor rotates from the angular position of 105 degrees, where is the original position of the rotor in this case, toward the angular position of 40 degrees. In this Figure, the characteristics of the coil spring with respect to the stroke are shown using solid lines when it is preloaded, and that are shown using dash lines when it is not preloaded. When the rotor rotates towards the above direction, the coil spring 36 is rotated and compressed in the counterclockwise direction viewed ~~from the front side~~ from the direction indicated by the arrow A-A in Fig. 11.

[0060] When the supply of the exciting current is stopped, the electro-magnetic torque between the rotor and the stator disappears, and the rotor is pushed back to the original position by the opposite torque of the coil spring 36. If the direction of the above exciting current is reversed, the electro-magnetic torque with the direction opposite to the above direction thereof will be generated, so that the rotor rotates toward clockwise direction in Fig. 12, and drives the spring driving ring 35 and the spring ring 31 on the rear side to rotate together toward clockwise direction, while the spring ring 31 on the front side is stopped by the stoppers 30a and 30b on the front side. As a result, the coil spring 36 is rotated and compressed in the clockwise direction viewed from the direction indicated by the arrow A-A in Fig. 11.